

Pace University

DigitalCommons@Pace

Honors College Theses

Pforzheimer Honors College

5-2020

Designing a School: Creating a Map for Pace University

Tanner Maple

Follow this and additional works at: https://digitalcommons.pace.edu/honorscollege_theses



Part of the [Graphic Design Commons](#)

Designing a School: Creating a Map for Pace University

Tanner Maple

Bachelor of Fine Arts, Graphic Design

Advisor: Brenda McManus, Art Department

Presentation: May 11, 2020

Graduation: May 20, 2020

Advisor Approval Page

Abstract

The map of a university is an essential tool for students, not only for navigation but also to promote the campus. When the map is outdated, students don't find it functional and it can not complete its purpose. With the map of Pace University's downtown campus, a new design was needed to go with the renovations that are taking place. When redesigning the map, features that are seen amongst the most common maps should be considered in the design. One feature that most maps now have is some sort of interactivity. To include this, maps have an online version that students can access from phones or computers. In my designs, I have redesigned the current map in a manner that is more beneficial to current students. While the designs stand on their own, they are also the basis for a more expanded design in the future. In this project, I am addressing the need for a more modern and functional system for the navigational needs for the Pace University community.

Table of Contents

Title Page.....	1
Advisor Approval Page.....	2
Abstract.....	3
Table of Contents.....	4
Introduction.....	5
Literature Review.....	5
The Need for a Mobile Map.....	5
Interactivity.....	8
Two-Dimensional vs. Three-Dimensional.....	9
Scale.....	11
Methodology.....	13
Overview.....	13
Physical Version.....	14
Online Version.....	17
The Future	17
Results.....	18
Conclusion.....	19
References.....	20
Appendix.....	22

Introduction

The map of a university campus is an essential tool for any student, both current and prospective. While it is used to help navigate from classroom to classroom, it can also be used for prospective students to gain a greater understanding of the layout of and structure of the campus. With the advancement of technology, maps have become more interactive, creating a new sense of user experience. With every student using cell phones, having a map accessible at any time is a must. When looking at the map of Pace University's downtown campus map, it is clear that improvements can be made. Not only is a new design needed, but the addition of an online component will bring it up to the standards that students are expecting. In order to design a well functioning map, the basic understandings of designing one must be followed. While comparing my design with others, both universities and not, I can design a map that will both look good and fulfill the purpose of getting students around the campus successfully.

Literature Review

The Need for a Mobile Map

When designing a map for a campus that will be both physical and digital, I have to understand why the campus might need certain types of maps. While most schools may have a map already, it may not be up to date to the standards that many students are looking for. These standards are the ability to be online and interactive. The article "The Digital Age of Campus Maps on Mobile Devices" discusses the increased use of mobile technology (Wu, Clarke, Jiang, Baba, & Buford, 2016). The article states that two-thirds of the American population now use mobile devices to access the internet. The article specifically mentions that the mobile devices are smartphones and not tablets or any other type of device. Because of the increase in internet

usage, campuses have had to make the jump into the age of technology. The article “Web Interactive Campus Map” also discusses the need for campuses to update their maps (Eder, Nocete, Rances, Tarrosa & Yanson, 2015). It goes into more detail about the differences between a static and interactive map, stating that an interactive map allows for “displaying useful information in an engaging and attractive way by inviting the user to take action” (Eder et al., 2015, p.62). It goes into the idea that the term interactive is broad, and an interactive map can come in different ways. The article explains that an interactive map can be a way to give information about different areas of the school.

The article also talks about the students that can benefit from a new, interactive map. It states that the campus can look better for potential incoming students. By having an aesthetically pleasing map can better the image of the school. A working map will also help prospective students get a sense of the campus and all that it offers (Eder et al., 2015). However, an interactive map is not only aimed at prospective students but all types of people that are at the campus. As explained in the article “The 21st Century Campus Map: Mapping the University of Wisconsin-Madison,” the map that was designed for their project had two main targets (Roth, Hoek, Woodruff, Erkenswick, McGlynn, & Przybylowski, 2009). The first was potential students, as mentioned before, but also new students to the university. The goal aimed at this audience was to help them with general information and the layout of the campus. Current students and faculty are the other audience. While they may already have a sense of direction around the campus, the need for more specific information about different areas of the campus helps gain a better understanding of the layout.

This research formed my thinking about making a map for Pace University's downtown campus. This concept comes from my own experience and the experiences of others. When I first came to Pace, I spent the first night on campus looking for all of my classes. I was not given a map to help navigate, which made me nervous that I would get lost and be late to class. These nerves, added on to the nerves of starting college, did not make for a pleasant first night on campus. Pace University consists of 8 different downtown buildings. Navigating the multiple buildings can be confusing to anyone, including students who have been here for years. While talking to my friends on campus, I hear a lot that they don't always go into all of the buildings that Pace has. When they do have to go into a new building, it can be easy to get lost. The faculty also don't frequent certain areas of Pace and can get confused by the layout of the buildings. One Pace Plaza, the main building of the downtown campus, has a confusing layout with the different wings and elevators that only go to certain floors. This is also the perfect time for Pace to get an updated map. With the new entrance finally being renovated, the new layout makes a new face for Pace. With the update of the buildings, it calls for an update to the map.

Referring back to the idea of making a mobile map, it's important to point out how Pace has handled its mobile application. The "My Pace" app already contains a map feature. However, this map is just Google Maps. On the map there are points that show the location of each building specifically and some information about each building. I will be using this information in the map that I design, but will be designing my own map. Instead of using Google maps, I will have to create a design of my own. This will allow for the creative face of the school to be seen. Using only Google Maps does not have the connection to the campus that a map should have. It does not allow for the interiors of the buildings to be seen. Using Google Maps also prevents the

identity of the school to be seen. With a new map, the look can be aimed at a more personalized experience.

Interactivity

Going back to the idea of interactivity, I have to understand the different ways that a map can be interactive. One of the most popular forms of interactivity is known as Location Based Service or LBS. This is where the exact location of the user will be projected live on the map. It can be seen in most navigation maps like Google Maps, or Waze. The project “Smart Campus Map” explains the idea of LBS (Nikoohehmat, 2013). Nikoohehmat explains that while LBS is great for outdoor navigation, it has issues when it comes to indoor navigation. Explained in the article, GPS signals can not penetrate the inside of buildings due to the solid walls, so different methods of using WiFi and positioning must be used in order to accurately track the user. The study “Web Interactive Campus Map” also uses LBS for navigation around the campus of the Mindanao University of Science and Technology (Eder et al., 2015). However, this study only looks for navigation of the outside campus, so it doesn’t need to figure out the problem of indoor navigation. It will just implement Google Maps in order to add navigation to their own map. However, this map will also add more aspects of interactivity. The other interactive aspect includes the information of the building, which shows the “direction, floor layouts, photos, room staffs, building and room events and room schedules” (Eder et al., 2015, p. 64). By adding the small features, the map changes from a static to an interactive map. If these features are present on the basic display, it will become overwhelming. The design of the map should be simple and help show the layout of the area. By hiding the extra information like the hours of rooms, that simple design stays.

In order to hide the information, different methods can be used to display the information when needed. One way to show the information would be in a new window. “Smart Campus Map” shows the use of a new window (Nikoohehmat, 2013). By adding a hyperlink, the user of the map can be sent to a different webpage. In the project, Nikoohehmat uses hyperlinks to link to the official pages of the campus buildings. While this method is easier to use because it just requires adding one link to a map, it is not the better option in my opinion. When it comes to user functionality, using the map should be intuitive. If the map sends the user to a new webpage and away from the map, I believe that the map loses its intent. All of the information should be in the same location. That leads to the other way to display hidden information, a popup window. An example of a popup window can be seen in figure 3.2 of “Web Interactive Campus Map” (Eder et al., 2015). I believe that this allows for better user functionality. A popup window keeps the user on the map. A lot of the same information that can be found on the web page of a building can be transferred to the popup window. By keeping the user on the map, the experience can be better for the user. If I was trying to look at a map and I was forced to leave the map every time I wanted to gain information, I would become irritated. What if I were to accidentally click on the wrong thing and then be sent out of the map? That does not seem like a pleasant experience. To me, it seems that using a popup window allows for all the same information to be supplied while also allowing for the best experience.

Two-Dimensional vs. Three-Dimensional

When it comes to the actual design of the map, two different versions can be used. The first version is a two-dimensional map. This can be described as a bird-eye’s view or a floor plan. It is all flat so everything covered on the map can be seen. The other type of map used is a

three-dimensional map. This has walls and different levels of floors and the actual structure of the building. Each one has advantages and disadvantages. 3D mapping helps show the size and dimensions of an area. While 3D modeling maps work well with an outdoor area, it may not be great for indoor mapping. The project “Development of 2D Map and 3D Model of GIT Campus using GIS Technology” uses both 2D and 3D techniques (K. Kulkarni, H. Kamble, A. Kulkarni, & Bangi, 2017). Two-dimensional maps are used to get the layout of the campus. If a map does not have the correct layout, then the map will not have the correct placement of buildings. With the creation of the 2D map, the 3D buildings are then created on top of it. In order to get the 3D buildings, the volume of each structure and how they look are both needed. Because the structures are built in a three-dimensional map, it can help with outside navigation. Knowing the size and look of a building can help with walking around a new area. However, this will not work as well for indoor spaces. “The Effects of 2D and 3D Maps on Learning Virtual Multi-Level Indoor Environments” shows this, where a 2D and 3D map are put up against each other (Giudice, & Li, 2013). In this study, the same area is mapped out in a two-dimensional and three-dimensional version. Participants are then asked to navigate around the area and use both types of maps to see which version they find better. The area has multiple floors and tests to see how the participants are able to find locations on each floor, seeing how maps layout on top of each other. The results have a clear outcome. From the conclusion, no map has a clear advantage over the other when it is digital. This can be because, with a digital map, it can be rotated in order to see all points that are on the map. However, when it comes to paper maps, the two-dimensional map was overwhelmingly liked more than the three-dimensional map. The participants found that using the two-dimensional maps on paper was easier to use to navigate

the multiple floors. Having a three-dimensional map prevents certain areas from being seen. As said earlier in the study “Poor visual access between floors due to occlusion from walls and ceilings further hinders the development of accurate multi-level cognitive maps”(Giudice, & Li, 2013, p. 8). The walls of the rooms in the building can block areas and make some areas unseen. When using a map, all areas of the map need to be seen in order to prevent the user from getting lost. If I or someone else gets lost while using a map, doesn't that go against the point of it?

This analysis leads me to the conclusion that I should use a two-dimensional map. While I do plan on making an online version of my map, I want to focus on the paper version. I hope to create a map that will help navigate the confusing layout of Pace. I have to properly show off the layout of each floor and how they compare to each other and the building as a whole. A two-dimensional map allows for a more cohesive design between the many aspects of the map, as well as a strong foundation for a future expansion. If more is needed to be added to the map, the two-dimensional design allows for new elements without the need for a whole new process. If I were to use a three-dimensional map, I would be forced to block certain rooms of the building. Creating 3D models of the buildings would also require more funding, time, and work than would be available to me. So, in order to increase the usability of the map, as well as being able to complete the project, I will create a two-dimensional map of Pace University.

Scale

The actual design of the map requires many techniques and considerations, such as visual language, hierarchy, and structure that must be thought about and incorporated. In order to understand the design of the map, I must define the different types of scales used when talking about map design. As discussed in the book *GIS Cartography*, Peterson (2015) says that the

terms of “large scale” and “small scale” get mixed up by even the best of cartographers. The terms are almost backward in a sense. When a map has a small scale design, it means that more area can be seen. With a large scale map, less area can be seen. The term large scale describes when the buildings are seen in more detail and are larger on the map. The small scale map shows the details as small and almost not there. In the book, the example shows that a small scale map would be the entire North America, while a large scale map would be a street. The importance of the scale of the map is studied in “Cartographic Design for Mobile Devices: A Case Study Using the UW-Madison Interactive Campus Map” (Davidson, 2014). This study tests the reaction of different map scales on different mobile device screen sizes. The participants of the study were given different sized devices with differently scaled maps, and then asked to rank how easy it was to navigate the campus of the University of Wisconsin-Madison. While there was no real significant difference in the size of the screen, a noticeable difference in the scale of the map was seen. By far, the participants were better at navigating around the campus when using the larger scale map. It had the highest accuracy in finding the locations and the shortest time in finding them.

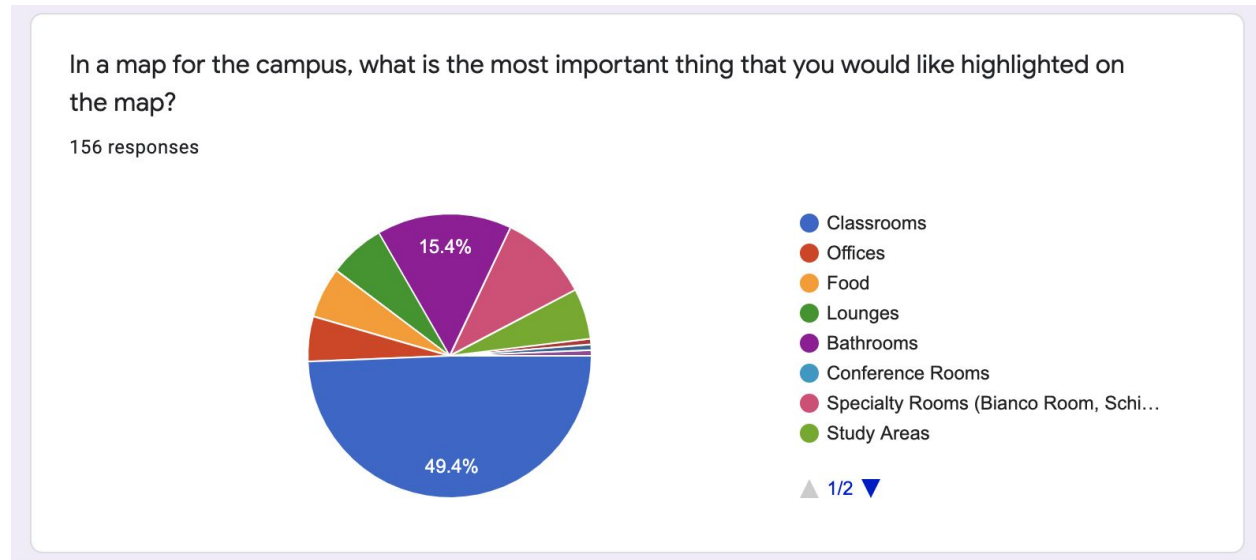
All of this information is important when going into the design of the map. I need my map to be the most accessible version for the broadest audience to use. With the information from the study, I learned that the map should be in a large scale style. However, I do need to keep in mind that the map will be in two different versions. The mobile version of the map can be manipulated to be scalable so the scale is determined for the default layout. If the user chooses to make it bigger or smaller, they can zoom in or out themselves. However, the paper version of the map can only be one size. From the results of the study and the information from the book, I

believe the best size map would be somewhere between an intermediate and large scale version. The layout of the streets needs to show all of the different buildings that are in the downtown campus. A large scale map may not be the best option to show the large area that the downtown campus occupies. I also do not want to overcrowd the map with lots of details that are not essential to it. For the interior maps, the large scale map will be used. I need to show a lot of details in order to make sure all of the important areas are shown. Also, the interior of the buildings are not large, so the map is designed for a large scale version.

Methodology

Overview

The design process of the map is split into three separate stages: the physical version, the online conversion, and how it can work in the future. Each of the three stages require different methods and techniques used when completing the designs. One of the important things that needed to be considered is the user. In order to make the best possible map, the focus for who is this targeted for must be thought about. My goal is to have current students be the main users of the map, but have faculty also benefit from it. Because students are the concern, their input should be heard. So, by asking students at Pace about which areas of the school they believe should be highlighted in the map, I took that information into the design of the map.



Physical Version

The first type of design that I have to create is the physical version that will be put on paper and handed out. To start, I designed the exterior layout of all the buildings and their locations. Pace University had eight total buildings within the downtown campus. Two different resources were used when creating this first type of design. The two sources were the already existing map of the campus and Google Maps. The campus map allowed me to get the placement of the different buildings, as well as the general area. Looking at the design of the map allowed me to see what aspects I should include in what buildings I need to add. Google Maps was used to get the shapes and layout of the buildings and streets of the campus. The area contains many streets and buildings, so being able to get the layout correct is important.

To design the map, Adobe Illustrator was used. This program was used in order to obtain the best possible design. Illustrator focuses on vector artwork. This means it is simple lines and points to create the design. By simplifying the design, it can be manipulated easier than other programs such as Photoshop. If I were to use Photoshop, I would be working in a resolution

based system. I would need to be locked into an aspect ratio and know the size that I want my artwork to be. Photoshop works in pixels, so in order to change the size of something, it needs to be a certain resolution. If the image is manipulated too much, it may cause it to be out of resolution, and become pixelated. Illustrator works with lines and points, so when something changes its size, it will keep the same look. The points and lines will change shape, but the resolution will remain the same. Being able to change the size of different things without worrying about the resolution and look of it allows me to change the layout and designs as I need until I finalize my design.

To create the actual design for the map, I recreated the different shapes of the streets and buildings. This presented some challenges in establishing the visual vocabulary and the level of detail appropriate for the solution. I want to make sure that the area is recognizable while keeping a simplistic look. One of my concerns with the existing map is the three-dimensional design, which cuts off essential streets and buildings, impeding navigation and causing confusion. The two-dimensional design allows for all buildings to be seen, but some details need to be hidden. I don't need to show the different levels of the buildings, just the overall shape that it has. When designing the shape of each building, the decision needed to be made on how the non-Pace buildings should be designed. Should each individual building be its own outline, or should a large group of them be combined? Both techniques were combined. If the map only included large groups, placements of the campus buildings relative to other buildings would be confused. If every individual building was outlined, then there would be too much detail, and the map would be overwhelmed and unreadable.

The interior maps of the buildings require some different techniques that need to be used when designing them. One of the biggest differences between the interior and exterior maps is the labeling. The inside of the buildings has different aspects than the exterior, requiring labels and names to indicate where and what they are. In order to distinguish between the different categories, different colors are used. Each color is assigned to a different aspect of the map, whether it be classrooms, bathrooms, or something else. To determine the different categories, that is where the student input is used. Asking about what features they find most important, I narrow down what is highlighted. If I did not condense the features, the map would be overwhelming with no clear direction.

The resources available for the interior of the buildings are more limited than the exterior. I was able to get a map of the main building, One Pace Plaza, from a version that was created from Mohini Gobin in the Honors College. While also looking for references, I was able to find the floor plans for the remodel that Pace underwent. While these do help to get a base and dimensions of the buildings, it does not give me every floor that I need. In order to complete the map, a lot of my personal observations are used. By walking around the buildings, I am able to observe where each room is located, where the entrances are, and how large they are relative to other rooms around it. While also walking around, each floor has a safety layout, showing the layout of the buildings in case of an emergency. While these may not be perfect, they do definitely help with the process. By using all of these different resources together, an interior map of each building can be designed.

Once the individual maps are completed, they need to be combined into a tangible version. This map needs to be functional, so people can use it when visiting the campus. The

maps will be put into a booklet. This booklet will be easily carried by students, allowing them to put it in backpacks or folders. The map needs to be small enough that students can carry it wherever they go, but still large enough so all information is clear. With this layout, each building would get its own individual page. This can open up to unique design capabilities with different page folds. With unique sizes and shapes of the buildings, folding the pages in special ways allow to show off the maps in different ways. This will add some more creative designs that are not usually found in a booklet.

Online Version

To create the online version of the map, I will be using Adobe XD. This program allows for easy and simple programming and prototypes for online creations. By using this program, it allows me to show off how I envision the online version looking. While this program does not allow for the most complicated coding, it gets the look, feel and interactive components of the application across. The online version is meant to add to the paper version. When viewing the map online, it is meant to help with navigation and information whenever the students need it. When clicking on a special room like the library or cafeteria, the hours will come up along with more information. By using the online version, not only will students have the map accessible from wherever they are, it will also provide more information than on the paper version.

The Future

With all of the changes that the university is undergoing, there is no doubt that more can be added to the designs of the map. Because of this, my designs serve as a foundation. It is a system designed to evolve with the expansions of the university. Pace University plans on undergoing renovations to the main campus building, as well as the construction of an entirely

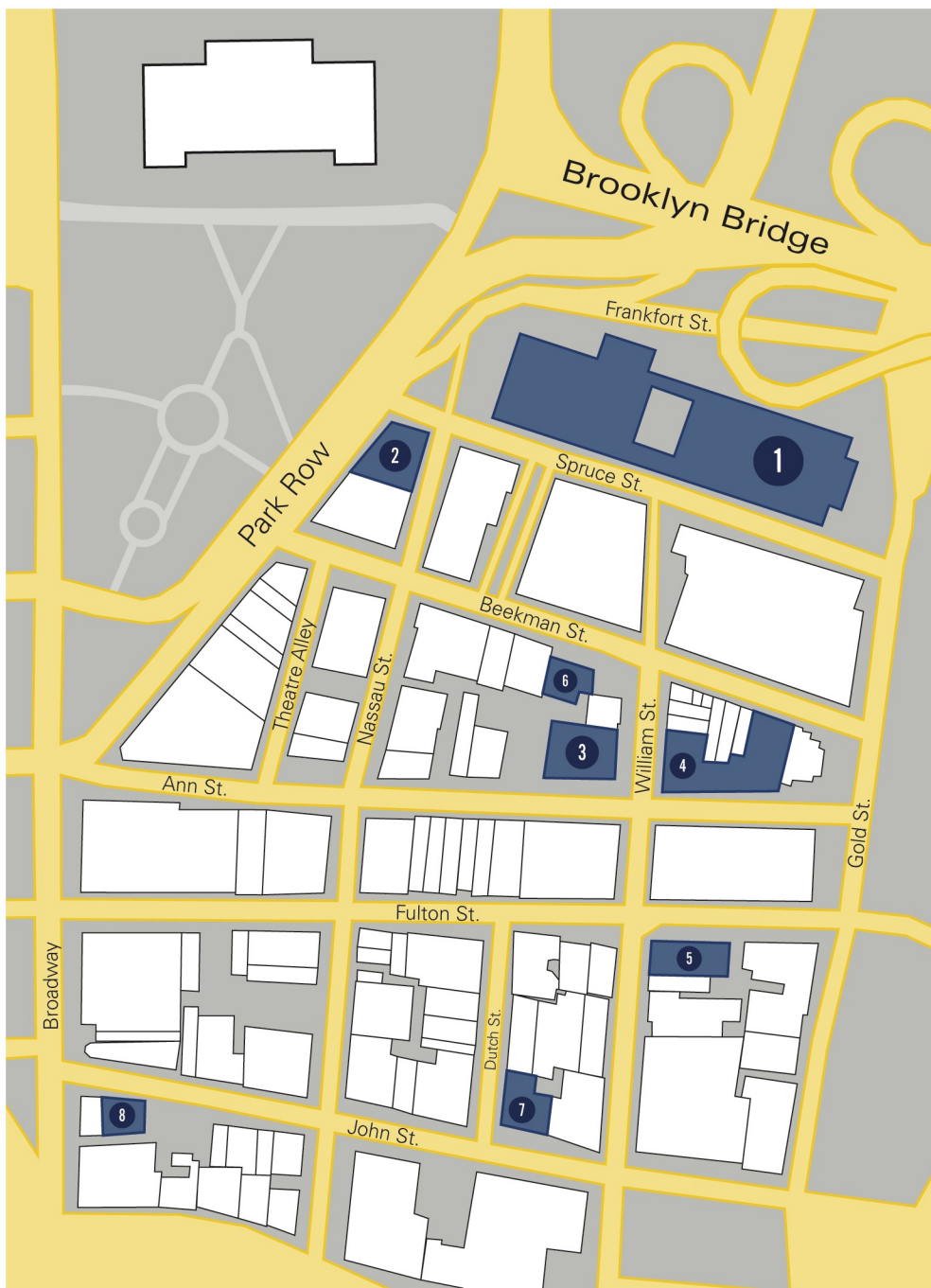
new building. This design allows for easy addition of new buildings. By just recreating the style and highlighting the same areas that are in the other buildings, new buildings can be added to the map at any time.

The design also allows for more to be added to the design that is already there. With preferences changing, some features in the future might want to be highlighted differently, depending on who is using it. More details, such as individual rooms and offices can be added depending on who is using the map.

The online features can also be expanded on in the future. One popular feature that can be added to the map is a navigation feature. With the right technology, the exact location of a student can be put onto the map with directions on where to go. With this feature, wayfinding can be made much easier.

Results

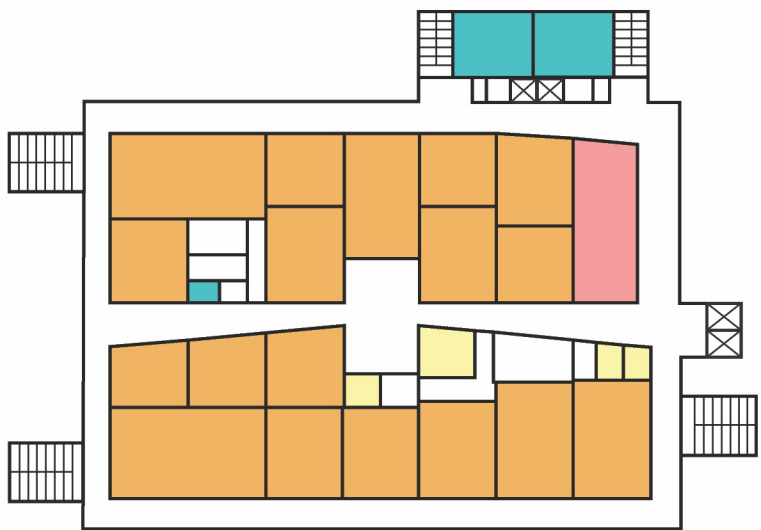
Map will be attached



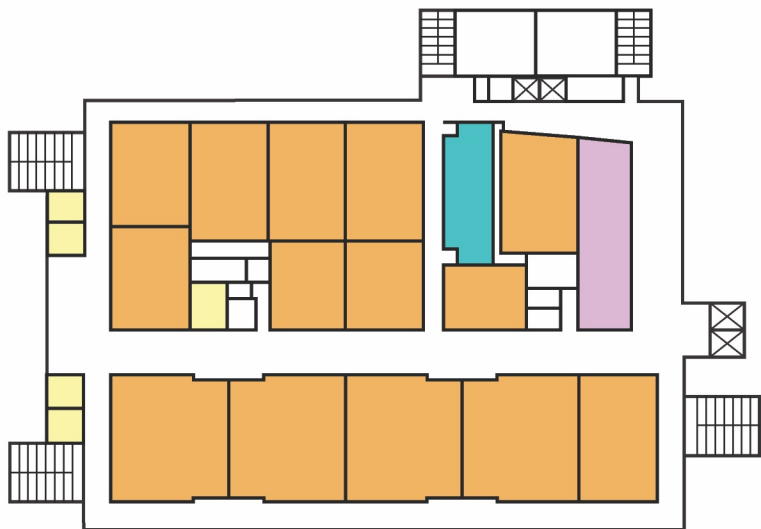
- 1 One Pace Plaza
- 2 41 Park Row
- 3 163 William St.
- 4 156 William St.
- 5 140 William St.
- 6 33 Beekman St.
- 7 55 John St.
- 8 182 Broadway

ONE PACE PLAZA

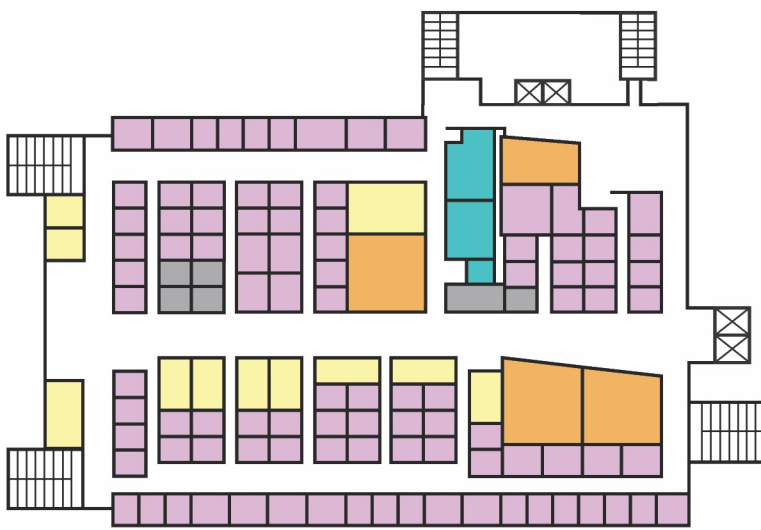
6th Floor



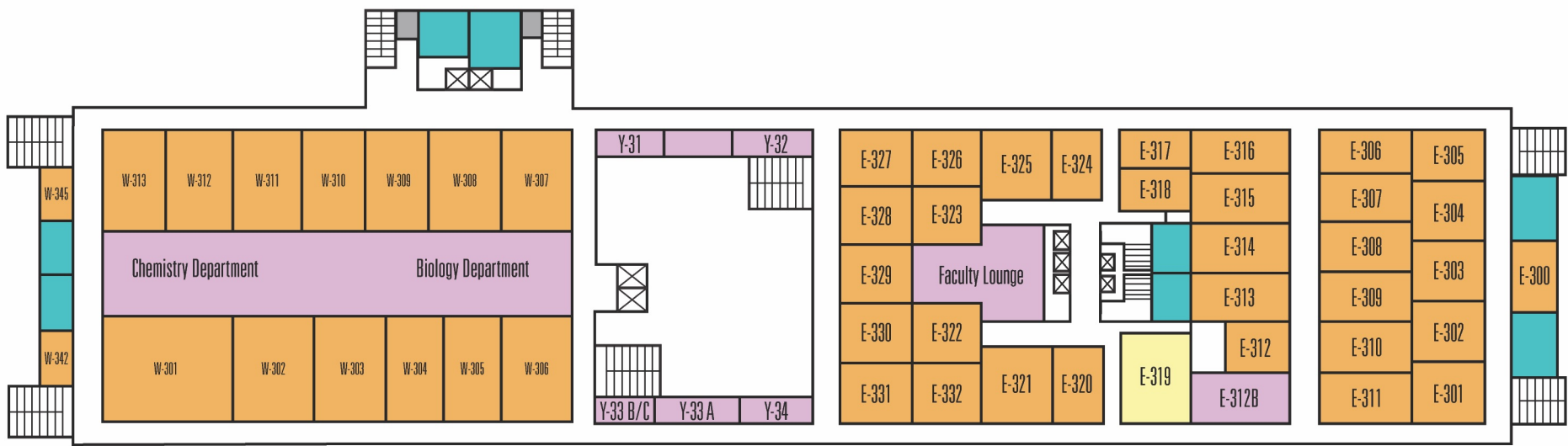
5th Floor



4th Floor



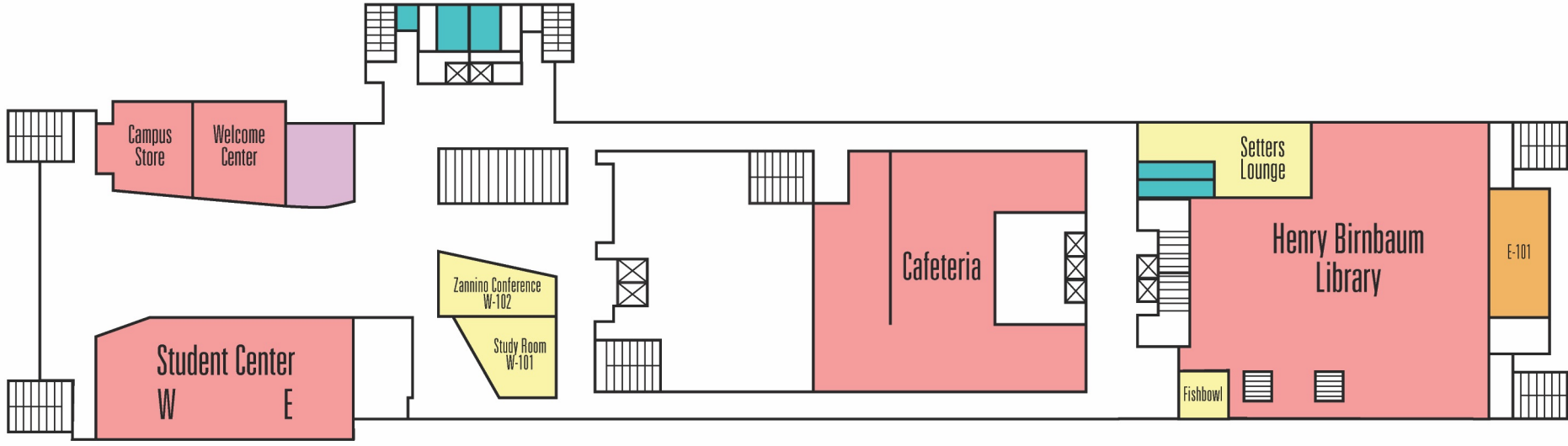
3rd Floor



2nd Floor



1st Floor



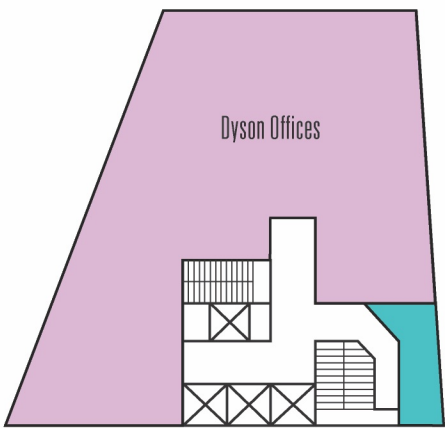
B - Level



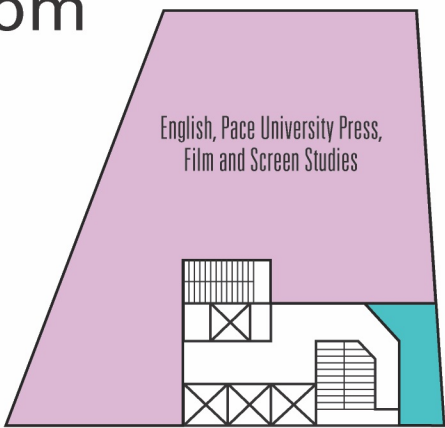
- Classroom
- Bathroom
- Office
- Lounge / Conference
- Specialty Room

41 ParkRow

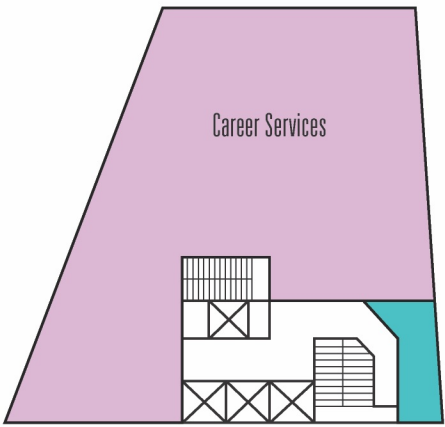
- Classroom
- Bathroom
- Office
- Lounge / Conference
- Specialty Room



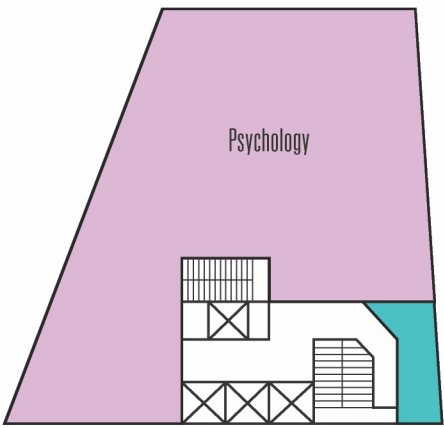
16th Floor



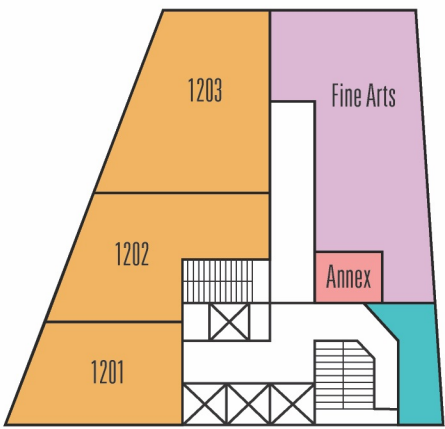
15th Floor



14th Floor



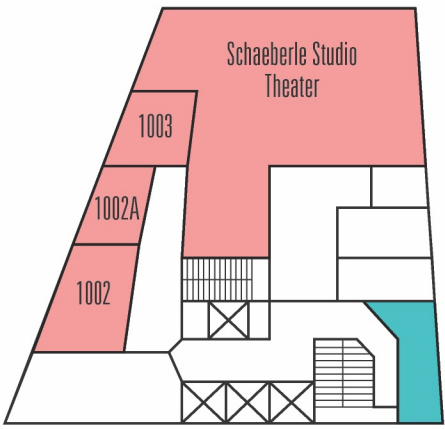
13th Floor



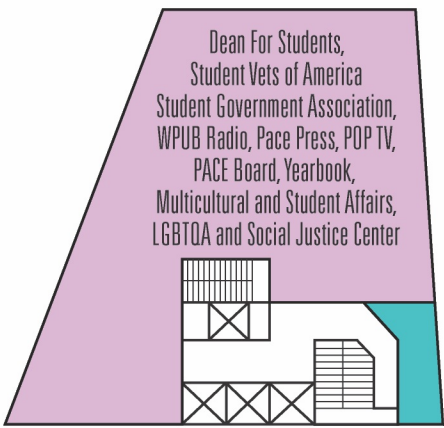
12th Floor



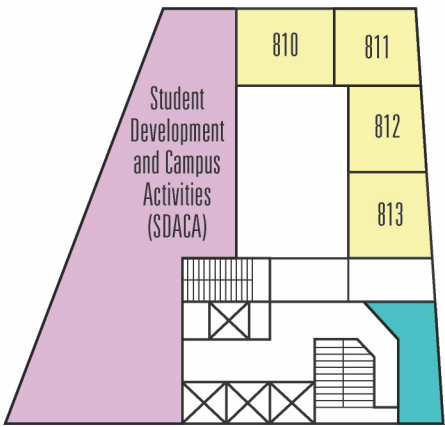
11th Floor



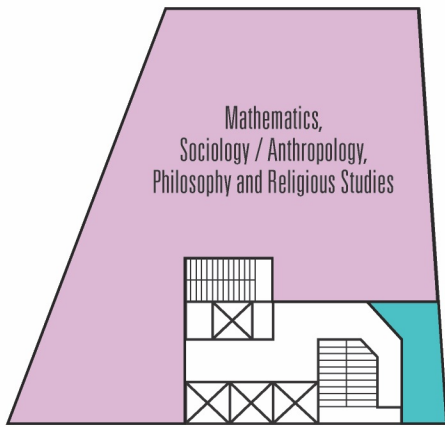
10th Floor



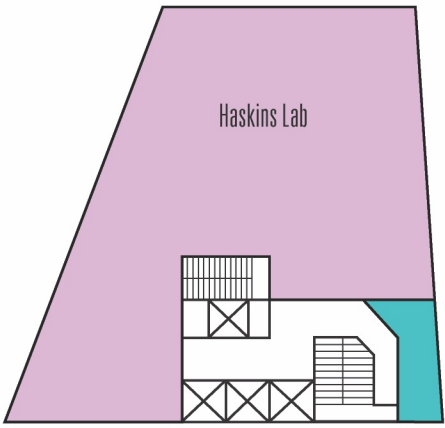
9th Floor



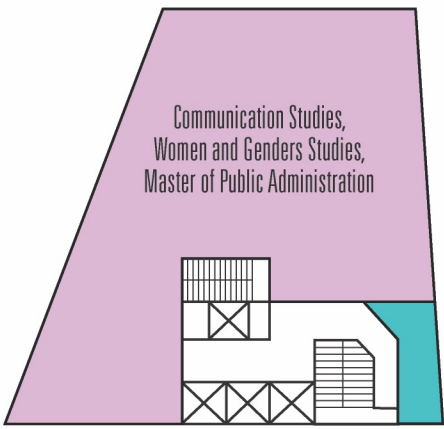
8th Floor



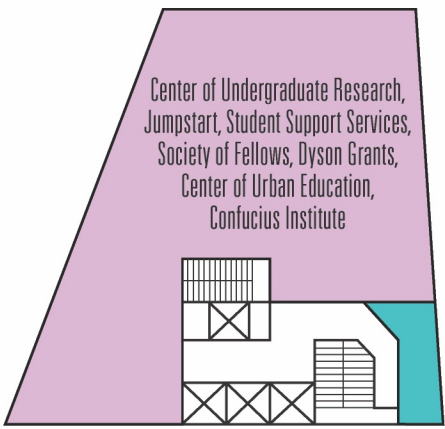
7th Floor



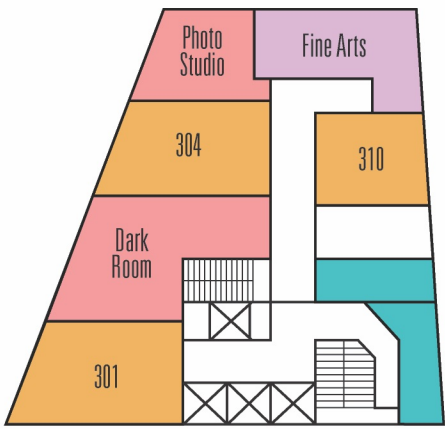
6th Floor



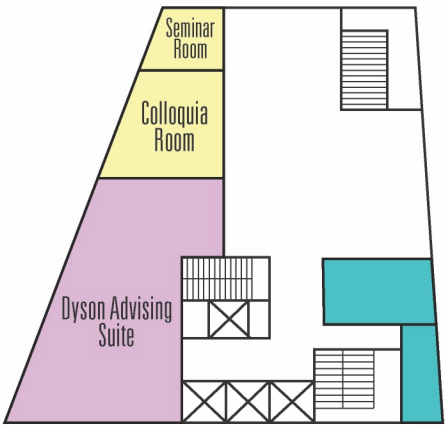
5th Floor



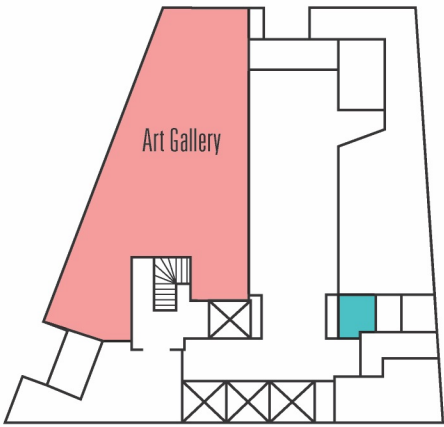
4th Floor



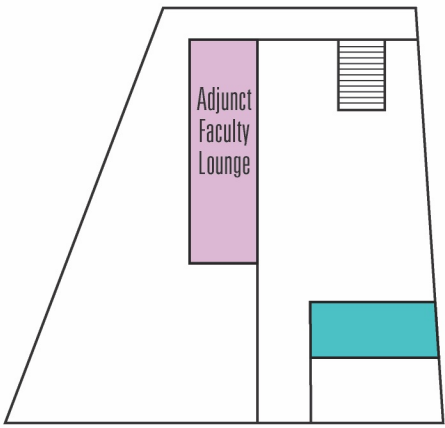
3rd Floor



2nd Floor



1st Floor

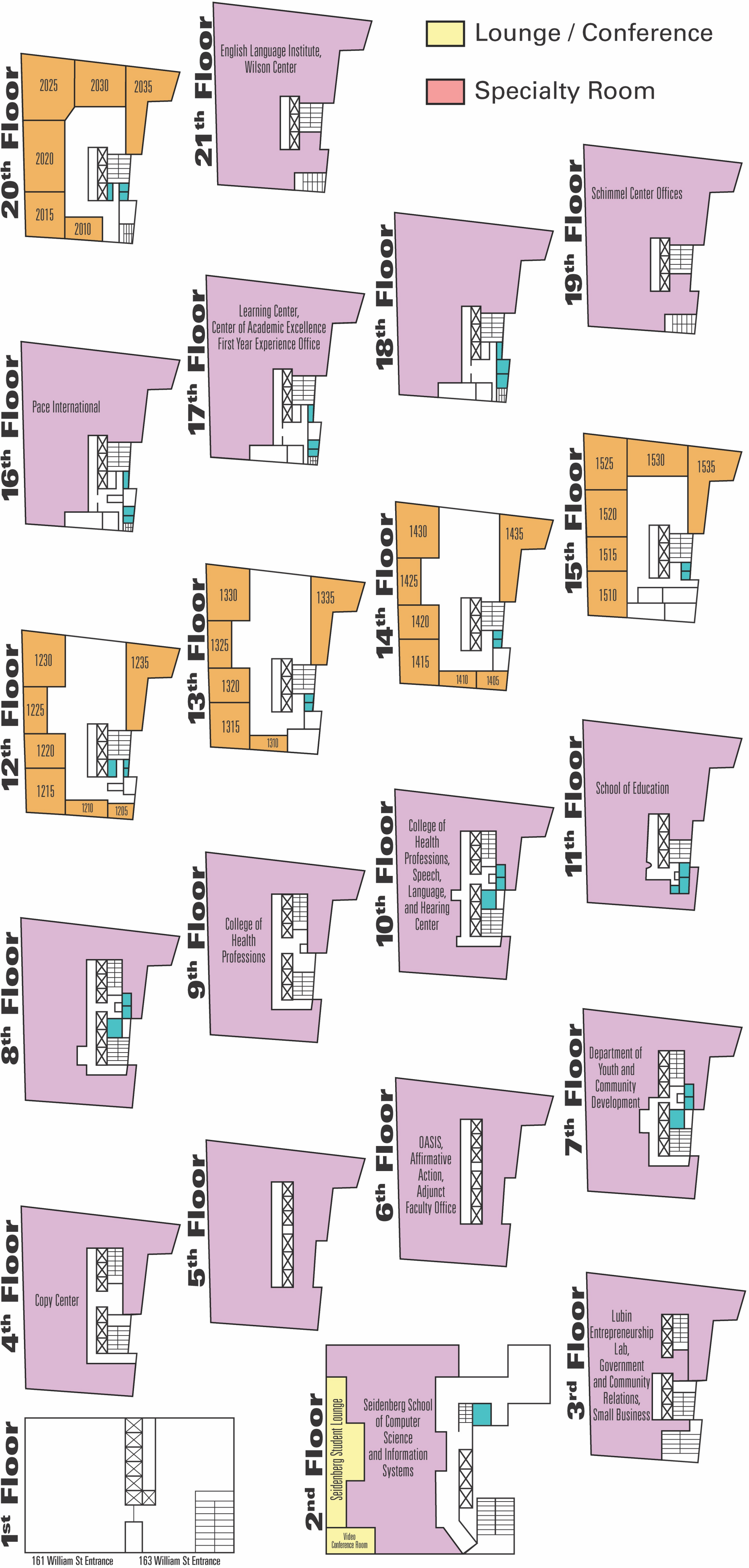


B - Level

163

WILLIAM ST

- Classroom
- Bathroom
- Office
- Lounge / Conference
- Specialty Room



Conclusion

By comparing the old and newly designed maps, more functionality and appeal has been added. Users can now navigate not only the streets in between buildings, but the halls of individual buildings to find the classrooms. With simplistic designs, the maps are easily readable, as well as adaptable. As the campus undergoes renovations, the new buildings and floors can easily be added to expand the map. The prototype of the online version allows for more interactivity than before, with the possibility of more navigation features added in the future. With the designs of the map, it allows for a good user experience with the possibility of more features and improvements in the future.

References

- Davidson, B. (2014) Cartographic design for mobile devices: a case study using the UW-Madison interactive campus map. *University of Wisconsin-Madison*.
- De Luca, A., & Portis, S. (2019). New York's subway map like you've never seen it before. *The New York Times*. Retrieved from <https://www.nytimes.com/interactive/2019/12/02/nyregion/nyc-subway-map.html>
- Eder, M., Nocete, C. J. L., Rances, G. L., Tarrosa, E. M., & Yanson, J. N. (2015) Web interactive campus map. *International Journal of Scientific & Technology Research*, 4(03), 62-67. <http://www.ijstr.org/final-print/mar2015/Web-Interactive-Campus-Map.pdf>
- Giudice, N., & Li, H. (2013) The effects of 2D and 3D maps on learning virtual multi-level indoor environments. *Research Gate*, 7-12. <https://www.researchgate.net/publication/262366010>
- Kulkarni, K. R., H, Y. C., Kamble, K. P., Kulkarni, A. A., & Bangi, S. C. (2017) Development of 2D map and 3D model of GIT campus using GIS technology. *International Research Journal of Engineering and Technology*, 4(06), 2597-2601. <https://www.irjet.net/archives/V4/i6/IRJET-V4I6655.pdf>
- Nikoohehmat, S. (2013) Smart campus map. *Technical University of Munich*. https://cartographymaster.eu/wp-content/theses/2014_Nikoohehmat_Thesis.pdf
- Peterson, G. N. (2015) *GIS Cartography*. Florida: CRC Press.
- Roth, R. E., Hoek, J. V. D., Woodruff, A., Erkenswick, A., McGlynn, E. & Przybylowski, J. (2009) The 21st century campus map: mapping the University of Wisconsin-Madison, *Journal of Maps*, 5(1), 1-8. <https://doi.org/10.4113/jom.2009.1036>

Wu, F., Clarke, D., Jiang, J., Baba, A., & Buford, S. (2016) The digital age of campus maps on mobile devices. *Journal of Computer and Communications*, 4, 22-30.

<http://www.scirp.org/journal/jcc> <http://dx.doi.org/10.4236/jcc.2016.47004>

Appendix

Visual Demonstration of Mobile Version: <https://www.youtube.com/watch?v=WOyv8AEaH1w>